



APPENDIX D

REVEGETATION OF DISTURBED AREAS



D - Revegetation of Disturbed Areas



Revegetation



Revegetation of Bare Soil Areas

This Appendix focuses on stabilization of disturbed soil or bare soil areas following silvicultural operations. A typical construction site erodes at a rate of up to 100,000 tons per square mile per year. This rate is 200 times greater than erosion from cropland and 2,000 times greater than erosion from Woodland (Pennsylvania Alliance for the Chesapeake Bay, Citizen's Guide to Soil Erosion Control, Chesapeake Bay Education Office). Proper harvest planning for the ongoing harvest, close-out, and stabilization of the tract is required to prevent excessive erosion and sedimentation of streams and channels. Without proper planning, stabilization and maintenance of disturbed soil areas, the harvested site can erode at rates approaching those of construction sites.

The successful mitigation of soil losses on harvested sites results in the reduction of on-site and off-site environmental damage and substantial savings to landowners, loggers and, in the long term, the Commonwealth of Virginia. When implemented properly, Best Management Practices can control soil movement to a point where there is only minimal loss of this very precious resource; no appreciable damage to the waters of the Commonwealth; less future productive soil loss; enhanced project aesthetics before, during and after harvesting; and fewer complaints from concerned government agencies and citizens. Notably, there is a state law that dictates the use of such measures.

Soil stabilization practices are necessary where soil is exposed and is likely to erode to adjacent streams. Stabilization through revegetation is recommended on all soil areas. Permanent soil stabilization should be applied to all disturbed soil areas immediately after harvest. Temporary



D - Revegetation of Disturbed Areas

soil stabilization should be applied within seven days to denuded areas where timber harvesting may not be final but will remain dormant for longer than 30 days. If the total harvest time of the operation is likely to exceed 30 days, the tract should be divided into parcels and each parcel permanently stabilized as soon as it is completed. A temporary or permanent vegetative cover should be established on all denuded areas that will not be affected by skidding or other soil disturbing activity immediately after construction of cut and fill slopes, haul roads, skid trails, log decks, etc.

Permanent vegetation should not be considered established until a ground cover is achieved that is uniform, mature enough to survive, and will inhibit erosion. If permanent vegetation is not established within a reasonable time period, additional attempts should be made and/or alternative measures considered.

Stabilization measures should be applied to earthen structures such as water bars, broad-based and rolling dips, dikes, traps, basins, and other diversions.

Cut and fill slopes should be constructed in a manner that will minimize erosion. Concentrated runoff should not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume, or slope drain structure.

Whenever water seeps from a slope face, adequate drainage or other protection should be provided.

Specifications for Revegetation

- Prior to seeding, install all necessary water control structures such as waterbars, broad-based dips, and turnouts.
- Select a seed mix appropriate for the conditions and the landowner's objectives for future use of the site. Most of the species in the following tables are available in Virginia. Seed immediately following harvest using the seasonal seed variety mixes and application rates provided in the following tables. Choose a mixture of Main Crop, Legumes and Grains/Grasses to equal a total of 100 to 150 pounds/acre seeding rate.
- Lime and fertilizer should not be applied to an area without first having the soil tested. Results from Virginia Tech take about two weeks and include lime and fertilizer application rates. There is a small charge for a soil test. Most Virginia soils are acidic and will require lime application. Proper pH helps ensure full use of applied fertilizer, so do not guess on lime and fertilizer application rates. In general, in areas with acidic soils, 1.5 tons of lime per acre and 600 pounds of fertilizer will assist germination and survival.
- To control erosion, seed must be able to germinate and grow. This requires adequate preparation of the seed bed. Disking, sub-soiling, or dragging brush or a chain across the area to be seeded may be necessary to ensure good contact between the seed and soil.

- Seed shall be broadcast using a broadcast seeder, drill or hydro seeder. Most seed varieties will successfully germinate when planting 1/8" to 1/4" below the soil surface. Drag chains or brush over the area again after seed broadcast to ensure good seed-soil contact.
- Seed broadcast in dry summer months and fall can be helped with an application of mulch. Straw or hay mulch is effective and inexpensive. Often straw bales that the landowner cannot use for livestock are perfect sources of mulch for log roads and landings.

Table 17 Seeding Mixtures and Guidelines for Revegetation of Critical Areas in Virginia				
Seeding Mixtures	Rates / Acre	Northern Piedmont, Mountains, Valley	Southern Piedmont, Coastal Plain	Comments
MAIN CROP - Choose one of the following or a combination				
Perennial Ryegrass K-31 Fescue	Total 60-75 lbs/acre	Mar 1 - May 15 Aug 15 - Nov 1 Sep 1 - Nov 15 Feb 15 - May 1	Feb - Apr Sep 15 - Nov 15 Nov 1 - Feb 1 Sep 15 - Nov 1	Choose one rye, perennial rye and/or fescue as a main crop grass. A combination can also be used in fall plantings. Use of annual rye outside peak seeding times is beneficial as a quick, temporary cover.
LEGUME - Choose one of the following or a combination				
Kobe orrean L. Koespedeza	15 lbs/acre	N/A	Mar 1 - May 15	A legume will provide wildlife food and cover and add nitrogen to the soil. Choose one ora combination in addition to your main crop.
Hairy or Woodford	15 lbs/acre	N/A	Feb 1 - May 15	
Bigflower	15 lbs/acre	Feb 15 - May 1	N/A	
Lathco Flatpea Alfalfa	25 lbs/acre	Sep 1 - Nov 1	N/A	
GRAINS & GRASSES - Choose one of the following or a combination				
Weeping Lovegrass	20 lbs/acre	Mar 15 - May 15	N/A	Adding additional grains and grasses ensures plant diversity if the main crop does not successfully seed. Many of these grasses produce grain seeds critical to game birds. Use Weeping Lovegrass on steep slopes when seeding in warm seasons.
Foxtail Millet	20 lbs/acre	May 15 - Aug 15	May 1 - Sep 1	
Hybrid Bermudagrass	15 lbs/acre	N/A	Mar 1 - May 15	
Choose a mixture of Main Crop, Legumes and Grains/Grasses to equal a total of 100 to 150 lbs/acre seeding rate.				

D - Revegetation of Disturbed Areas

Critical Area Planting

Soil stabilization requirements may increase in severely disturbed or highly sensitive areas. The site should be prepared as indicated in the previous section. Higher seed rates that include fast-germinating grains and grasses are recommended in the table below. Critical areas include eroding skid trails leading directly to streams, areas where culverts were removed or disturbed, or areas impacted by severe storms or floods. Mulching should always occur for critical area planting at rates of 2 to 4 tons of mulch per acre. If this type of planting occurs in mid-winter, consider mulch only until the spring seeding period occurs.

Table 18 Critical Planting Area		
	Per 1,000 Sq Ft	Per Acre
Late Winter / Spring		
Oats	2 lbs	95 lbs
Rye	3 lbs	140 lbs
Ryegrass	1 lb	45 lbs
Oats & Ryegrass	1 lb - 1/2 lb	45-60 lbs
Oats & Korean Lespedeza	1 lb - 1/2 lb	45-60 lbs
Summer		
Sundangrass	1 lb	35-45 lbs
Browntop Millet	1 lb	30-40 lbs
Weeping Lovegrass	5 lbs	25 lbs
Late Summer / Early Winter		
Rye	3 lbs	140 lbs
Ryegrass	1 lb	45 lbs
Oats (before Oct 1)	2 lbs	90 lbs
Barley (before Oct 15)	3 lbs	140 lbs
Wheat (after Oct 1)	3 lbs	140 lbs
Rye & Ryegrass	1-1/2 lbs	70 lbs



The Use of Native Plants for Restoration

Native grasses, shrubs, wildflowers, and trees are natural to the ecosystems of Virginia. Many natural habitats for some of our native plants are rapidly being lost, and along with them the environmental benefits that they provide. Using native plants for restoration helps preserve native species and their ecological relationships with other plants and animals. Erosion and flood control, animal habitat, and nitrogen fixation are but a few of the values provided to Virginia. By including native plant species in our land management prescriptions, we can help conserve natural ecosystems and the organisms that are dependent on these well-adapted communities.

What are Native Plants?

Native species are classified as those that occur in the region in which they have evolved. Plants and animals evolve in specific habitats over extended periods of time. This selective development is a response to physical and biotic processes characteristic of that region, and is driven by a combination of interactive forces: vegetation and soil, soil and landform, and landform and vegetation. Drought, precipitation, solar radiation, slope position and orientation, geologic substrate, and hydrologic factors all play a part in contributing to the ecological processes with which a plant evolves. Native plants, therefore, possess certain traits that make them uniquely adapted to local conditions.

Planting Methods for Native Warm Season Grasses

A specialized grass drill is necessary to plant big and little bluestem and indiagrass. These drills may be locally available from the Virginia Department of Game and Inland Fisheries (804-598-3706) or from the local Soil and Water Conservation District. Conventional equipment can be used to plant switchgrass and coastal panicgrass (alfalfa seed box on grain drill) and eastern gamagrass (corn planter). Indiagrass and big and little bluestem seed are fluffy and will not pass through conventional equipment unless they are ordered as debarbed or brushed, which is an extra expense.

Native warm season grasses can be planted using either the no-till method or with conventional tilling. With either technique, the seedbed should be cultipacked after drilling to ensure good seed contact with mineral soil. No-till planting is probably the preferred method since soil disturbance is lessened, thus reducing germination of competing weeds. Potential soil erosion is minimized, and buried rocks are not brought to the surface. May and June are the preferred planting months for native warm season grasses, although in Coastal Plain areas, late April may be suitable. Some have had good results planting into the first few days of July in the Piedmont and Blue Ridge provinces.

D - Revegetation of Disturbed Areas

Planting Rates

Warm season grass planting rates for grazing or wildlife (recommended by Virginia Department of Game and Inland Fisheries):

Table 19 Planting Rates			
Grass Species	For Grazing		For Wildlife
	Drilled	Broadcast	
	(Lb. Pure Live Seed, PLS/ac.)		
Switchgrass	7	9	5
Big Bluestem	8	10	7
Indiangrass	7	10	7
Coastal Panicgrass	10	10	8
Eastern Gamagrass	8	*	7
* Not recommended			

For more information:

Virginia Native Plant Society
Virginia State Arboretu
Blandy Experimental Farm
400 Blandy Farm Road, Unit 2
Boyce, Virginia 22620
Ph: (540) 540-837-1600
vnpsoc@shentel.net
www.vnps.org

Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, Third Floor
Richmond, Virginia 23219
Ph: (804) 786-7951
Fx: (804) 371-2674
www.dcr.state.va.us/dnh

Virginia Department of Game and Inland
Fisheries
4010 West Broad Street
Richmond, Virginia 23230
Ph: (804) 367-1000
Fx: (804) 367-9147
www.dgif.state.va.us

USDA Natural Resources Conservation Service
Richmond State Office
1606 Santa Rosa Road, Suite 209
Richmond, Virginia 23229-5014
State Conservationist, M. Denise Doetzer
Ph: (804) 287-1691
Fx: (804) 287-1737
www.va.nrcs.usda.gov

[illegible]